

SEQUENCE LISTING

<110> CHEUNG, WING Y.
GAGNON, MARIE-JOSEE
LAFOREST, MARTIN
LANDRY, BENOIT S.

<120> COMPOSITIONS AND METHODS FOR IDENTIFYING PLANTS HAVING
INCREASED TOLERANCE TO IMIDAZOLINONE HERBICIDES

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<170> PatentIn Ver. 3.2

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Arg Ser Glu Leu Ser Glu Gln Lys Gln Lys Phe Pro Leu Ser Phe Lys	
430 435 440	
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Thr Phe Gly Glu Ala Ile Pro Pro Gln Tyr Ala Ile Gln Ile Leu Asp	
445 450 455	
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Glu Leu Thr Glu Gly Lys Ala Ile Ile Ser Thr Gly Val Gly Gln His	
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cag atg tgg gcg gcg cag ttt tac aag tac agg aag ccg aga cag tgg	1491
Gln Met Trp Ala Ala Gln Phe Tyr Lys Tyr Arg Lys Pro Arg Gln Trp	
475 480 485	
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Leu Ser Ser Ser Gly Leu Gly Ala Met Gly Phe Gly Leu Pro Ala Ala	
490 495 500 505	
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Ile Gly Ala Ser Val Ala Asn Pro Asp Ala Ile Val Val Asp Ile Asp	
510 515 520	
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Gly Asp Gly Ser Phe Ile Met Asn Val Gln Glu Leu Ala Thr Ile Arg	
525 530 535	
gta gag aat ctt cct gtg aag ata ctc ttg tta aac aac cag cat ctt	1683
Val Glu Asn Leu Pro Val Lys Ile Leu Leu Leu Asn Asn Gln His Leu	
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ggg atg gtc atg caa tgg gaa gat cgg ttc tac aaa gct aac aga gct	1731
Gly Met Val Met Gln Trp Glu Asp Arg Phe Tyr Lys Ala Asn Arg Ala	
555 560 565	
cac act tat ctc ggg gac ccg gca agg gag aac gag atc ttc cct aac	1779
His Thr Tyr Leu Gly Asp Pro Ala Arg Glu Asn Glu Ile Phe Pro Asn	
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Met Leu Gln Phe Ala Gly Ala Cys Gly Ile Pro Ala Ala Arg Val Thr	
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Lys Lys Glu Glu Leu Arg Glu Ala Ile Gln Thr Met Leu Asp Thr Pro	
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Gly Pro Tyr Leu Leu Asp Val Ile Cys Pro His Gln Glu His Val Leu	
620 625 630	
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Pro Met Ile Pro Ser Gly Gly Thr Phe Lys Asp Val Ile Thr Glu Gly	
635 640 645	
gat ggt cgc act aag tac tgagagatga agctgggtgat cgatcatatg	2019
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Thr Ser Pro Ser Pro Ile Ser Leu Thr Ala Lys Pro Ser Ser Lys Ser															
5 10 15 20															
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Pro Leu Pro Ile Ser Arg Phe Ser Leu Pro Phe Ser Leu Thr Pro Gln															
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Lys Pro Ser Ser Arg Leu His Arg Pro Leu Ala Ile Ser Ala Val Leu															
40 45 50															
aac tca ccc gtc aat gtc gca cct gaa aaa acc gac aag atc aag act	246														
Asn Ser Pro Val Asn Val Ala Pro Glu Lys Thr Asp Lys Ile Lys Thr															
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Phe Ile Ser Arg Tyr Ala Pro Asp Glu Pro Arg Lys Gly Ala Asp Ile															
70 75 80															
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Leu Val Glu Ala Leu Glu Arg Gln Gly Val Glu Thr Val Phe Ala Tyr															
85 90 95 100															
ccc gga ggt gcc tcc atg gag atc cac caa gcc ttg act cgc tcc tcc	390														
Pro Gly Gly Ala Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Ser															
105 110 115															
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Thr Ile Arg Asn Val Leu Pro Arg His Glu Gln Gly Gly Val Phe Ala															
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Ala Glu Gly Tyr Ala Arg Ser Ser Gly Lys Pro Gly Ile Cys Ile Ala															
135 140 145															

act tcg ggt ccc gga gct acc aac ctc gtc agc ggg tta gcc gac gcg	534
Thr Ser Gly Pro Gly Ala Thr Asn Leu Val Ser Gly Leu Ala Asp Ala	
150 155 160	
atg ctt gac agt gtt cct ctc gtc gcc atc aca gga cag gtc cct cgc	582
Met Leu Asp Ser Val Pro Leu Val Ala Ile Thr Gly Gln Val Pro Arg	
165 170 175 180	
cgg atg atc ggt act gac gcg ttc caa gag acg cca atc gtt gag gta	630
Arg Met Ile Gly Thr Asp Ala Phe Gln Glu Thr Pro Ile Val Glu Val	
185 190 195	
acg agg tct att acg aaa cat aac tat ctg gtg atg gat gtt gat gac	678
Thr Arg Ser Ile Thr Lys His Asn Tyr Leu Val Met Asp Val Asp Asp	
200 205 210	
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Ile Pro Arg Ile Val Gln Glu Ala Phe Phe Leu Ala Thr Ser Gly Arg	
215 220 225	
ccc gga ccg gtt ttg gtt gat gtt cct aag gat att cag cag cag ctt	774
Pro Gly Pro Val Leu Val Asp Val Pro Lys Asp Ile Gln Gln Gln Leu	
230 235 240	
gcg att cct aac tgg gat caa cct atg cgc ttg cct ggc tac atg tct	822
Ala Ile Pro Asn Trp Asp Gln Pro Met Arg Leu Pro Gly Tyr Met Ser	
245 250 255 260	
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Arg Leu Pro Gln Pro Pro Glu Val Ser Gln Leu Gly Gln Ile Val Arg	
265 270 275	
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Leu Ile Ser Glu Ser Lys Arg Pro Val Leu Tyr Val Gly Gly Gly Ser	
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Leu Asn Ser Ser Glu Glu Leu Gly Arg Phe Val Glu Leu Thr Gly Ile	
295 300 305	
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Pro Val Ala Ser Thr Leu Met Gly Leu Gly Ser Tyr Pro Cys Asn Asp	
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Glu Leu Ser Leu Gln Met Leu Gly Met His Gly Thr Val Tyr Ala Asn	
325 330 335 340	
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Tyr Ala Val Glu His Ser Asp Leu Leu Leu Ala Phe Gly Val Arg Phe	
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Asp	Asp	Arg	Val	Thr	Gly	Lys	Leu	Glu	Ala	Phe	Ala	Ser	Arg	Ala	Lys	
			360					365					370			
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Ile	Val	His	Ile	Asp	Ile	Asp	Ser	Ala	Glu	Ile	Gly	Lys	Asn	Lys	Thr	
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cct	cac	gtg	tct	gtg	tgt	ggg	gat	gta	aag	ctg	gct	ttg	caa	ggg	atg	1254
Pro	His	Val	Ser	Val	Cys	Gly	Asp	Val	Lys	Leu	Ala	Leu	Gln	Gly	Met	
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aac	aag	gtt	ctt	gag	aac	cgg	gcg	gag	gag	ctc	aag	ctt	gat	ttc	ggg	1302
Asn	Lys	Val	Leu	Glu	Asn	Arg	Ala	Glu	Glu	Leu	Lys	Leu	Asp	Phe	Gly	
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Val	Trp	Arg	Ser	Glu	Leu	Ser	Glu	Gln	Lys	Gln	Lys	Phe	Pro	Leu	Ser	
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ttc	aaa	acg	ttt	gga	gaa	gcc	att	cct	ccg	cag	tac	gcg	att	cag	gtc	1398
Phe	Lys	Thr	Phe	Gly	Glu	Ala	Ile	Pro	Pro	Gln	Tyr	Ala	Ile	Gln	Val	
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cta	gac	gag	cta	acc	caa	ggg	aag	gca	att	atc	agt	act	ggg	gtt	gga	1446
Leu	Asp	Glu	Leu	Thr	Gln	Gly	Lys	Ala	Ile	Ile	Ser	Thr	Gly	Val	Gly	
		455					460					465				
cag	cat	cag	atg	tgg	gcg	gcg	cag	ttt	tac	aag	tac	agg	aag	ccg	agg	1494
Gln	His	Gln	Met	Trp	Ala	Ala	Gln	Phe	Tyr	Lys	Tyr	Arg	Lys	Pro	Arg	
	470					475					480					
cag	tgg	ctg	tcg	tcc	tca	gga	ctc	gga	gct	atg	ggg	ttc	gga	ctt	cct	1542
Gln	Trp	Leu	Ser	Ser	Ser	Gly	Leu	Gly	Ala	Met	Gly	Phe	Gly	Leu	Pro	
485					490					495					500	
gct	gcg	att	gga	gcg	tct	gtg	gcg	aac	cct	gat	gcg	att	gtt	gtg	gac	1590
Ala	Ala	Ile	Gly	Ala	Ser	Val	Ala	Asn	Pro	Asp	Ala	Ile	Val	Val	Asp	
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Ile	Asp	Gly	Asp	Gly	Ser	Phe	Ile	Met	Asn	Val	Gln	Glu	Leu	Ala	Thr	
			520					525					530			
atc	cgt	gta	gag	aat	ctt	cct	gtg	aag	ata	ctc	ttg	tta	aac	aac	cag	1686
Ile	Arg	Val	Glu	Asn	Leu	Pro	Val	Lys	Ile	Leu	Leu	Leu	Asn	Asn	Gln	
		535					540					545				
cat	ctt	ggg	atg	gtc	atg	caa	tgg	gaa	gat	cgg	ttc	tac	aaa	gct	aac	1734
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<210> 68
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 68
ataagtgtga gctctgttag 20

<210> 69
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 69
ggtccccgag ataagtgtga 20

<210> 70
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 70
tcccttgccg ggtccccgag 20

<210> 71
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 71
gatctcgttc tcccttgccg 20

<210> 72
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 72
tgttagggaa gatctcgttc 20

<210> 73
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 73
aactgcagca tgttagggaa 20

<210> 74
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 74
agctcctgca aactgcagca 20

<210> 75
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 75
gaatcccgca agtcctgca 20

<210> 76
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 76
ctcgagctg gaatcccgca 20

<210> 77
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 77
cttcgtcact ctcgagctg 20

<210> 78
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 78
gttcttcttt cttcgtcact 20

<210> 79
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 79
 gcttctcgga gttcttcttt 20

<210> 80
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 80
 tgtctgaata gcttctcgga 20

<210> 81
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 81
 tatccagcat tgtctgaata 20

<210> 82
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 oligonucleotide

<400> 82
 ggtccaggtg tatccagcat 20

<210> 83
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 83
caacaggtac ggtccaggtg 20

<210> 84
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 84
agatgacatc caacaggtac 20

<210> 85
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 85
gtcatgcaat gggaagatcg g 21

<210> 86
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 86
ccgatcttcc cattgcatga c 21

<210> 87
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 87
gtcatgcaat tggaagatcg g 21

<210> 88
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
oligonucleotide

<400> 88
ccgatcttcc aattgcatga c 21

<210> 89
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 89
tacatctttg aaagtgcc a 19

<210> 90
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 90
ggcgtttggt gttagggttg a 21

<210> 91
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 91
cgtctgggaa caaccaaaag t 21

<210> 92
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 92
ggaaagctcg aggctttcgc t 21

<210> 93
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 93
atcaccagct tcattctctca gt 22

<210> 94
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 94
ggaaagctcg aggcgtttgc g 21

<210> 95
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 95
gtgttaccga tgatcc 16

<210> 96
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 96
gggatggtca tgcaat 16

<210> 97
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 97
caagtgggtgg 10

<210> 98
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 98
caaatgggtgg 10

<210> 99
 <211> 9
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 99
 gggaagatc

9

<210> 100
 <211> 9
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 100
 tggaagatc

9

<210> 101
 <211> 655
 <212> PRT
 <213> Brassica napus

<220>
 <221> MOD_RES
 <222> (268)..(268)
 <223> Variable amino acid

<400> 101
 Met Ala Ala Ala Thr Ser Ser Ser Pro Ile Ser Leu Thr Ala Lys Pro
 1 5 10 15
 Ser Ser Lys Ser Pro Leu Pro Ile Ser Arg Phe Ser Leu Pro Phe Ser
 20 25 30
 Leu Thr Pro Gln Lys Asp Ser Ser Arg Leu His Arg Pro Leu Ala Ile
 35 40 45
 Ser Ala Val Leu Asn Ser Pro Val Asn Val Ala Pro Pro Ser Pro Glu
 50 55 60
 Lys Thr Asp Lys Asn Lys Thr Phe Val Ser Arg Tyr Ala Pro Asp Glu
 65 70 75 80
 Pro Arg Lys Gly Ala Asp Ile Leu Val Glu Ala Leu Glu Arg Gln Gly
 85 90 95

Val Glu Thr Val Phe Ala Tyr Pro Gly Gly Ala Ser Met Glu Ile His
 100 105 110
 Gln Ala Leu Thr Arg Ser Ser Thr Ile Arg Asn Val Leu Pro Arg His
 115 120 125
 Glu Gln Gly Gly Val Phe Ala Ala Glu Gly Tyr Ala Arg Ser Ser Gly
 130 135 140
 Lys Pro Gly Ile Cys Ile Ala Thr Ser Gly Pro Gly Ala Thr Asn Leu
 145 150 155 160
 Val Ser Gly Leu Ala Asp Ala Met Leu Asp Ser Val Pro Leu Val Ala
 165 170 175
 Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala Phe Gln
 180 185 190
 Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys His Asn Tyr
 195 200 205
 Leu Val Met Asp Val Asp Asp Ile Pro Arg Ile Val Gln Glu Ala Phe
 210 215 220
 Phe Leu Ala Thr Ser Gly Arg Pro Gly Pro Val Leu Val Asp Val Pro
 225 230 235 240
 Lys Asp Ile Gln Gln Gln Leu Ala Ile Pro Asn Trp Asp Gln Pro Met
 245 250 255
 Arg Leu Pro Gly Tyr Met Ser Arg Leu Pro Gln Xaa Pro Glu Val Ser
 260 265 270
 Gln Leu Gly Gln Ile Val Arg Leu Ile Ser Glu Ser Lys Arg Pro Val
 275 280 285
 Leu Tyr Val Gly Gly Gly Ser Leu Asn Ser Ser Glu Glu Leu Gly Arg
 290 295 300
 Phe Val Glu Leu Thr Gly Ile Pro Val Ala Ser Thr Leu Met Gly Leu
 305 310 315 320
 Gly Ser Tyr Pro Cys Asn Asp Glu Leu Ser Leu Gln Met Leu Gly Met
 325 330 335
 His Gly Thr Val Tyr Ala Asn Tyr Ala Val Glu His Ser Asp Leu Leu
 340 345 350
 Leu Ala Phe Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys Leu Glu
 355 360 365
 Ala Phe Ala Ser Arg Ala Lys Ile Val His Ile Asp Ile Asp Ser Ala
 370 375 380

Glu Ile Gly Lys Asn Lys Thr Pro His Val Ser Val Cys Gly Asp Val
 385 390 395 400
 Lys Leu Ala Leu Gln Gly Met Asn Lys Val Leu Glu Asn Arg Ala Glu
 405 410 415
 Glu Leu Lys Leu Asp Phe Gly Val Trp Arg Ser Glu Leu Ser Glu Gln
 420 425 430
 Lys Gln Lys Phe Pro Leu Ser Phe Lys Thr Phe Gly Glu Ala Ile Pro
 435 440 445
 Pro Gln Tyr Ala Ile Gln Ile Leu Asp Glu Leu Thr Glu Gly Lys Ala
 450 455 460
 Ile Ile Ser Thr Gly Val Gly Gln Arg Gln Met Trp Ala Ala Gln Phe
 465 470 475 480
 Tyr Lys Tyr Arg Lys Pro Arg Gln Trp Leu Ser Ser Ser Gly Leu Gly
 485 490 495
 Ala Met Gly Phe Gly Leu Pro Ala Ala Ile Gly Ala Ser Val Ala Asn
 500 505 510
 Pro Asp Ala Ile Val Val Asp Ile Asp Gly Asp Gly Ser Phe Ile Met
 515 520 525
 Asn Val Gln Glu Leu Ala Thr Ile Arg Val Glu Asn Leu Pro Val Lys
 530 535 540
 Ile Leu Leu Leu Asn Asn Gln His Leu Gly Met Val Met Gln Trp Glu
 545 550 555 560
 Asp Arg Phe Tyr Lys Ala Asn Arg Ala His Thr Tyr Leu Gly Asp Pro
 565 570 575
 Ala Arg Glu Asn Glu Ile Phe Pro Asn Met Leu Gln Phe Ala Gly Ala
 580 585 590
 Cys Gly Ile Pro Ala Ala Arg Val Thr Lys Lys Glu Glu Leu Arg Glu
 595 600 605
 Ala Ile Gln Thr Met Leu Asp Thr Pro Gly Pro Tyr Leu Leu Asp Val
 610 615 620
 Ile Cys Pro His Gln Glu His Val Leu Pro Met Ile Pro Asn Gly Gly
 625 630 635 640
 Thr Phe Lys Asp Val Ile Thr Glu Gly Asp Gly Arg Thr Lys Tyr
 645 650 655

<210> 102
 <211> 652
 <212> PRT
 <213> Brassica napus

<220>
 <221> MOD_RES
 <222> (464)..(464)
 <223> Variable amino acid

<400> 102
 Met Ala Ala Ala Thr Ser Ser Ser Pro Ile Ser Leu Thr Ala Lys Pro
 1 5 10 15
 Ser Ser Lys Ser Pro Leu Pro Ile Ser Arg Phe Ser Leu Pro Phe Ser
 20 25 30
 Leu Thr Pro Gln Lys Pro Ser Ser Arg Leu His Arg Pro Leu Ala Ile
 35 40 45
 Ser Ala Val Leu Asn Ser Pro Val Asn Val Ala Pro Glu Lys Thr Asp
 50 55 60
 Lys Ile Lys Thr Phe Ile Ser Arg Tyr Ala Pro Asp Glu Pro Arg Lys
 65 70 75 80
 Gly Ala Asp Ile Leu Val Glu Ala Leu Glu Arg Gln Gly Val Glu Thr
 85 90 95
 Val Phe Ala Tyr Pro Gly Gly Ala Ser Met Glu Ile His Gln Ala Leu
 100 105 110
 Thr Arg Ser Ser Thr Ile Arg Asn Val Leu Pro Arg His Glu Gln Gly
 115 120 125
 Gly Val Phe Ala Ala Glu Gly Tyr Ala Arg Ser Ser Gly Lys Pro Gly
 130 135 140
 Ile Cys Ile Ala Thr Ser Gly Pro Gly Ala Thr Asn Leu Val Ser Gly
 145 150 155 160
 Leu Ala Asp Ala Met Leu Asp Ser Val Pro Leu Val Ala Ile Thr Gly
 165 170 175
 Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala Phe Gln Glu Thr Pro
 180 185 190
 Ile Val Glu Val Thr Arg Ser Ile Thr Lys His Asn Tyr Leu Val Met
 195 200 205
 Asp Val Asp Asp Ile Pro Arg Ile Val Gln Glu Ala Phe Phe Leu Ala
 210 215 220

Thr Ser Gly Arg Pro Gly Pro Val Leu Val Asp Val Pro Lys Asp Ile
 225 230 235 240
 Gln Gln Gln Leu Ala Ile Pro Asn Trp Asp Gln Pro Met Arg Leu Pro
 245 250 255
 Gly Tyr Met Ser Arg Leu Pro Gln Pro Pro Glu Val Ser Gln Leu Gly
 260 265 270
 Gln Ile Val Arg Leu Ile Ser Glu Ser Lys Arg Pro Val Leu Tyr Val
 275 280 285
 Gly Gly Gly Ser Leu Asn Ser Ser Glu Glu Leu Gly Arg Phe Val Glu
 290 295 300
 Leu Thr Gly Ile Pro Val Ala Ser Thr Leu Met Gly Leu Gly Ser Tyr
 305 310 315 320
 Pro Cys Asn Asp Glu Leu Ser Leu Gln Met Leu Gly Met His Gly Thr
 325 330 335
 Val Tyr Ala Asn Tyr Ala Val Glu His Ser Asp Leu Leu Leu Ala Phe
 340 345 350
 Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys Leu Glu Ala Phe Ala
 355 360 365
 Ser Arg Ala Lys Ile Val His Ile Asp Ile Asp Ser Ala Glu Ile Gly
 370 375 380
 Lys Asn Lys Thr Pro His Val Ser Val Cys Gly Asp Val Lys Leu Ala
 385 390 395 400
 Leu Gln Gly Met Asn Lys Val Leu Glu Asn Arg Ala Glu Glu Leu Lys
 405 410 415
 Leu Asp Phe Gly Val Trp Arg Ser Glu Leu Ser Glu Gln Lys Gln Lys
 420 425 430
 Phe Pro Leu Ser Phe Lys Thr Phe Gly Glu Ala Ile Pro Pro Gln Tyr
 435 440 445
 Ala Ile Gln Val Leu Asp Glu Leu Thr Gln Gly Lys Ala Ile Ile Xaa
 450 455 460
 Thr Gly Val Gly Gln His Gln Met Trp Ala Ala Gln Phe Tyr Lys Tyr
 465 470 475 480
 Arg Lys Pro Arg Gln Trp Leu Ser Ser Ser Gly Leu Gly Ala Met Gly
 485 490 495
 Phe Gly Leu Pro Ala Ala Ile Gly Ala Ser Val Ala Asn Pro Asp Ala
 500 505 510

Ile Val Val Asp Ile Asp Gly Asp Gly Ser Phe Ile Met Asn Val Gln
 515 520 525
 Glu Leu Ala Thr Ile Arg Val Glu Asn Leu Pro Val Lys Ile Leu Leu
 530 535 540
 Leu Asn Asn Gln His Leu Gly Met Val Met Gln Leu Glu Asp Arg Phe
 545 550 555 560
 Tyr Lys Ala Asn Arg Ala His Thr Tyr Leu Gly Asp Pro Ala Arg Glu
 565 570 575
 Asn Glu Ile Phe Pro Asn Met Leu Gln Phe Ala Gly Ala Cys Gly Ile
 580 585 590
 Pro Ala Ala Arg Val Thr Lys Lys Glu Glu Leu Arg Glu Ala Ile Gln
 595 600 605
 Thr Met Leu Asp Thr Pro Gly Pro Tyr Leu Leu Asp Ala Ile Cys Pro
 610 615 620
 His Gln Glu His Val Leu Pro Met Ile Pro Ser Gly Gly Thr Phe Lys
 625 630 635 640
 Asp Val Ile Thr Glu Gly Asp Gly Arg Thr Lys Tyr
 645 650

<210> 103

<211> 655

<212> PRT

<213> Brassica napus

<400> 103

Met Ala Ala Ala Thr Ser Ser Ser Pro Ile Ser Leu Thr Ala Lys Pro
 1 5 10 15
 Ser Ser Lys Ser Pro Leu Pro Ile Ser Arg Phe Ser Leu Pro Phe Ser
 20 25 30
 Leu Thr Pro Gln Lys Asp Ser Ser Arg Leu His Arg Pro Leu Ala Ile
 35 40 45
 Ser Ala Val Leu Asn Ser Pro Val Asn Val Ala Pro Pro Ser Pro Glu
 50 55 60
 Lys Thr Asp Lys Asn Lys Thr Phe Val Ser Arg Tyr Ala Pro Asp Glu
 65 70 75 80
 Pro Arg Lys Gly Ala Asp Ile Leu Val Glu Ala Leu Glu Arg Gln Gly
 85 90 95
 Val Glu Thr Val Phe Ala Tyr Pro Gly Gly Ala Ser Met Glu Ile His
 100 105 110

Gln Ala Leu Thr Arg Ser Ser Thr Ile Arg Asn Val Leu Pro Arg His
 115 120 125
 Glu Gln Gly Gly Val Phe Ala Ala Glu Gly Tyr Ala Arg Ser Ser Gly
 130 135 140
 Lys Pro Gly Ile Cys Ile Ala Thr Ser Gly Pro Gly Ala Thr Asn Leu
 145 150 155 160
 Val Ser Gly Leu Ala Asp Ala Met Leu Asp Ser Val Pro Leu Val Ala
 165 170 175
 Ile Thr Gly Gln Val Pro Arg Arg Met Ile Gly Thr Asp Ala Phe Gln
 180 185 190
 Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys His Asn Tyr
 195 200 205
 Leu Val Met Asp Val Asp Asp Ile Pro Arg Ile Val Gln Glu Ala Phe
 210 215 220
 Phe Leu Ala Thr Ser Gly Arg Pro Gly Pro Val Leu Val Asp Val Pro
 225 230 235 240
 Lys Asp Ile Gln Gln Gln Leu Ala Ile Pro Asn Trp Asp Gln Pro Met
 245 250 255
 Arg Leu Pro Gly Tyr Met Ser Arg Leu Pro Gln Pro Pro Glu Val Ser
 260 265 270
 Gln Leu Gly Gln Ile Val Arg Leu Ile Ser Glu Ser Lys Arg Pro Val
 275 280 285
 Leu Tyr Val Gly Gly Gly Ser Leu Asn Ser Ser Glu Glu Leu Gly Arg
 290 295 300
 Phe Val Glu Leu Thr Gly Ile Pro Val Ala Ser Thr Leu Met Gly Leu
 305 310 315 320
 Gly Ser Tyr Pro Cys Asn Asp Glu Leu Ser Leu Gln Met Leu Gly Met
 325 330 335
 His Gly Thr Val Tyr Ala Asn Tyr Ala Val Glu His Ser Asp Leu Leu
 340 345 350
 Leu Ala Phe Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys Leu Glu
 355 360 365
 Ala Phe Ala Ser Arg Ala Lys Ile Val His Ile Asp Ile Asp Ser Ala
 370 375 380
 Glu Ile Gly Lys Asn Lys Thr Pro His Val Ser Val Cys Gly Asp Val
 385 390 395 400

Lys Leu Ala Leu Gln Gly Met Asn Lys Val Leu Glu Asn Arg Ala Glu
 405 410 415
 Glu Leu Lys Leu Asp Phe Gly Val Trp Arg Ser Glu Leu Ser Glu Gln
 420 425 430
 Lys Gln Lys Phe Pro Leu Ser Phe Lys Thr Phe Gly Glu Ala Ile Pro
 435 440 445
 Pro Gln Tyr Ala Ile Gln Ile Leu Asp Glu Leu Thr Glu Gly Lys Ala
 450 455 460
 Ile Ile Ser Thr Gly Val Gly Gln His Gln Met Trp Ala Ala Gln Phe
 465 470 475 480
 Tyr Lys Tyr Arg Lys Pro Arg Gln Trp Leu Ser Ser Ser Gly Leu Gly
 485 490 495
 Ala Met Gly Phe Gly Leu Pro Ala Ala Ile Gly Ala Ser Val Ala Asn
 500 505 510
 Pro Asp Ala Ile Val Val Asp Ile Asp Gly Asp Gly Ser Phe Ile Met
 515 520 525
 Asn Val Gln Glu Leu Ala Thr Ile Arg Val Glu Asn Leu Pro Val Lys
 530 535 540
 Ile Leu Leu Leu Asn Asn Gln His Leu Gly Met Val Met Gln Trp Glu
 545 550 555 560
 Asp Arg Phe Tyr Lys Ala Asn Arg Ala His Thr Tyr Leu Gly Asp Pro
 565 570 575
 Ala Arg Glu Asn Glu Ile Phe Pro Asn Met Leu Gln Phe Ala Gly Ala
 580 585 590
 Cys Gly Ile Pro Ala Ala Arg Val Thr Lys Lys Glu Glu Leu Arg Glu
 595 600 605
 Ala Ile Gln Thr Met Leu Asp Thr Pro Gly Pro Tyr Leu Leu Asp Val
 610 615 620
 Ile Cys Pro His Gln Glu His Val Leu Pro Met Ile Pro Ser Gly Gly
 625 630 635 640
 Thr Phe Lys Asp Val Ile Thr Glu Gly Asp Gly Arg Thr Lys Tyr
 645 650 655

<210> 104

<211> 652

<212> PRT

<213> Brassica napus

<400> 104

Met	Ala	Ala	Ala	Thr	Ser	Pro	Ser	Pro	Ile	Ser	Leu	Thr	Ala	Lys	Pro	1	5	10	15
Ser	Ser	Lys	Ser	Pro	Leu	Pro	Ile	Ser	Arg	Phe	Ser	Leu	Pro	Phe	Ser	20	25	30	
Leu	Thr	Pro	Gln	Lys	Pro	Ser	Ser	Arg	Leu	His	Arg	Pro	Leu	Ala	Ile	35	40	45	
Ser	Ala	Val	Leu	Asn	Ser	Pro	Val	Asn	Val	Ala	Pro	Glu	Lys	Thr	Asp	50	55	60	
Lys	Ile	Lys	Thr	Phe	Ile	Ser	Arg	Tyr	Ala	Pro	Asp	Glu	Pro	Arg	Lys	65	70	75	80
Gly	Ala	Asp	Ile	Leu	Val	Glu	Ala	Leu	Glu	Arg	Gln	Gly	Val	Glu	Thr	85	90	95	
Val	Phe	Ala	Tyr	Pro	Gly	Gly	Ala	Ser	Met	Glu	Ile	His	Gln	Ala	Leu	100	105	110	
Thr	Arg	Ser	Ser	Thr	Ile	Arg	Asn	Val	Leu	Pro	Arg	His	Glu	Gln	Gly	115	120	125	
Gly	Val	Phe	Ala	Ala	Glu	Gly	Tyr	Ala	Arg	Ser	Ser	Gly	Lys	Pro	Gly	130	135	140	
Ile	Cys	Ile	Ala	Thr	Ser	Gly	Pro	Gly	Ala	Thr	Asn	Leu	Val	Ser	Gly	145	150	155	160
Leu	Ala	Asp	Ala	Met	Leu	Asp	Ser	Val	Pro	Leu	Val	Ala	Ile	Thr	Gly	165	170	175	
Gln	Val	Pro	Arg	Arg	Met	Ile	Gly	Thr	Asp	Ala	Phe	Gln	Glu	Thr	Pro	180	185	190	
Ile	Val	Glu	Val	Thr	Arg	Ser	Ile	Thr	Lys	His	Asn	Tyr	Leu	Val	Met	195	200	205	
Asp	Val	Asp	Asp	Ile	Pro	Arg	Ile	Val	Gln	Glu	Ala	Phe	Phe	Leu	Ala	210	215	220	
Thr	Ser	Gly	Arg	Pro	Gly	Pro	Val	Leu	Val	Asp	Val	Pro	Lys	Asp	Ile	225	230	235	240
Gln	Gln	Gln	Leu	Ala	Ile	Pro	Asn	Trp	Asp	Gln	Pro	Met	Arg	Leu	Pro	245	250	255	
Gly	Tyr	Met	Ser	Arg	Leu	Pro	Gln	Pro	Pro	Glu	Val	Ser	Gln	Leu	Gly	260	265	270	

Gln Ile Val Arg Leu Ile Ser Glu Ser Lys Arg Pro Val Leu Tyr Val
 275 280 285
 Gly Gly Gly Ser Leu Asn Ser Ser Glu Glu Leu Gly Arg Phe Val Glu
 290 295 300
 Leu Thr Gly Ile Pro Val Ala Ser Thr Leu Met Gly Leu Gly Ser Tyr
 305 310 315 320
 Pro Cys Asn Asp Glu Leu Ser Leu Gln Met Leu Gly Met His Gly Thr
 325 330 335
 Val Tyr Ala Asn Tyr Ala Val Glu His Ser Asp Leu Leu Leu Ala Phe
 340 345 350
 Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys Leu Glu Ala Phe Ala
 355 360 365
 Ser Arg Ala Lys Ile Val His Ile Asp Ile Asp Ser Ala Glu Ile Gly
 370 375 380
 Lys Asn Lys Thr Pro His Val Ser Val Cys Gly Asp Val Lys Leu Ala
 385 390 395 400
 Leu Gln Gly Met Asn Lys Val Leu Glu Asn Arg Ala Glu Glu Leu Lys
 405 410 415
 Leu Asp Phe Gly Val Trp Arg Ser Glu Leu Ser Glu Gln Lys Gln Lys
 420 425 430
 Phe Pro Leu Ser Phe Lys Thr Phe Gly Glu Ala Ile Pro Pro Gln Tyr
 435 440 445
 Ala Ile Gln Val Leu Asp Glu Leu Thr Gln Gly Lys Ala Ile Ile Ser
 450 455 460
 Thr Gly Val Gly Gln His Gln Met Trp Ala Ala Gln Phe Tyr Lys Tyr
 465 470 475 480
 Arg Lys Pro Arg Gln Trp Leu Ser Ser Ser Gly Leu Gly Ala Met Gly
 485 490 495
 Phe Gly Leu Pro Ala Ala Ile Gly Ala Ser Val Ala Asn Pro Asp Ala
 500 505 510
 Ile Val Val Asp Ile Asp Gly Asp Gly Ser Phe Ile Met Asn Val Gln
 515 520 525
 Glu Leu Ala Thr Ile Arg Val Glu Asn Leu Pro Val Lys Ile Leu Leu
 530 535 540
 Leu Asn Asn Gln His Leu Gly Met Val Met Gln Trp Glu Asp Arg Phe
 545 550 555 560

Tyr Lys Ala Asn Arg Ala His Thr Tyr Leu Gly Asp Pro Ala Arg Glu
 565 570 575
 Asn Glu Ile Phe Pro Asn Met Leu Gln Phe Ala Gly Ala Cys Gly Ile
 580 585 590
 Pro Ala Ala Arg Val Thr Lys Lys Glu Glu Leu Arg Glu Ala Ile Gln
 595 600 605
 Thr Met Leu Asp Thr Pro Gly Pro Tyr Leu Leu Asp Val Ile Cys Pro
 610 615 620
 His Gln Glu His Val Leu Pro Met Ile Pro Ser Gly Gly Thr Phe Glu
 625 630 635 640
 Asp Val Ile Thr Glu Gly Asp Gly Arg Thr Lys Tyr
 645 650

<210> 105
 <211> 10
 <212> PRT
 <213> Brassica napus

<400> 105
 Ile Pro Ser Gly Gly Thr Phe Lys Asp Val
 1 5 10

<210> 106
 <211> 30
 <212> DNA
 <213> Brassica napus

<400> 106
 atcccaagtg gtggcacttt caaagatgta 30

<210> 107
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 107
 catcttttgaa agtgccacca c 21

<210> 108
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 108
 Ile Pro Asn Gly Gly Thr Phe Lys Asp Val
 1 5 10

<210> 109
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic primer

<400> 109
 atcccaaagt gtggcacttt caaagatgta

30

<210> 110
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic primer

<400> 110
 catctttgaa agtgccacca t

21

<210> 111
 <211> 10
 <212> PRT
 <213> Brassica napus

<400> 111
 Met Gln Trp Glu Asp Arg Phe Tyr Lys Ala
 1 5 10

<210> 112
 <211> 30
 <212> DNA
 <213> Brassica napus

<400> 112
atgcaatggg aagatcgggtt ctacaaagct 30

<210> 113
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 113
ctttgtagaa ccgatcttcc c 21

<210> 114
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 114
Met Gln Leu Glu Asp Arg Phe Tyr Lys Ala
1 5 10

<210> 115
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 115
atgcaattgg aagatcgggtt ctacaaagct 30

<210> 116
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
primer

<400> 116
ctttgtagaa ccgatcttcc a